

ABSTRACT

The invention relates to a technique for forming a thin film of good quality on a base substance via an intermediate layer. Such a film formation technique is suitably applicable to formation of an oxide high-temperature superconductor thin film usable for a superconducting wire material, a superconducting device or the like.

In the method of forming a thin film on a base substance via an intermediate layer, an interface energy E_a at an interface A between the base substance and the intermediate layer, an interface energy E_b at an interface B between the intermediate layer and the thin film, and an interface energy E_c at an interface C between the base substance and the thin film in a state where the intermediate layer is omitted are calculated, and then a substance for the intermediate layer is selected so as to satisfy conditions of $E_a < E_c$ and $E_b < E_c$.

(12)特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関
国際事務局



07 MAR 2005



(43) 国際公開日
2004年5月13日 (13.05.2004)

PCT

(10) 国際公開番号
WO 2004/040046 A1

- (51) 国際特許分類⁷: C30B 29/22, H01L 39/24
- (21) 国際出願番号: PCT/JP2003/013887
- (22) 国際出願日: 2003年10月29日 (29.10.2003)
- (25) 国際出願の言語: 日本語
- (26) 国際公開の言語: 日本語
- (30) 優先権データ:
特願 2002-318477
2002年10月31日 (31.10.2002) JP
- (71) 出願人 (米国を除く全ての指定国について): 住友電気工業株式会社 (SUMITOMO ELECTRIC INDUSTRIES, LTD.) [JP/JP]; 〒541-0041 大阪府 大阪市 中

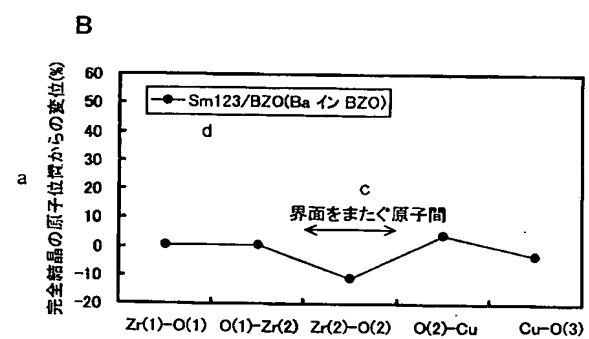
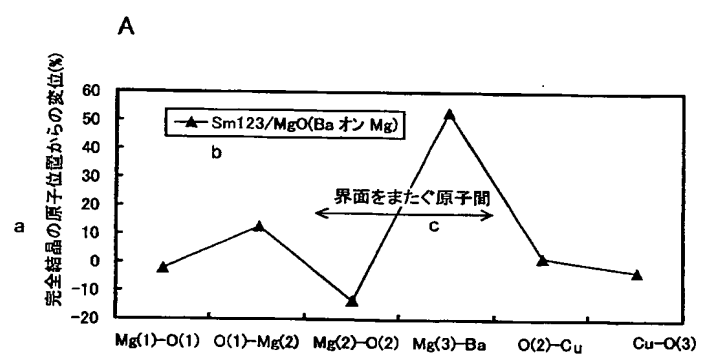
央区北浜四丁目5番33号 Osaka (JP). 財団法人国際超電導産業技術研究センター (INTERNATIONAL SUPERCONDUCTIVITY TECHNOLOGY CENTER, THE JURIDICAL FOUNDATION) [JP/JP]; 〒105-0004 東京都港区新橋5丁目34番3号 栄進開発ビル6階 Tokyo (JP).

(72) 発明者; および
(75) 発明者/出願人 (米国についてのみ): 長谷川 勝哉 (HASEGAWA, Katsuya) [JP/JP]; 〒135-0062 東京都江東区東雲1丁目10番13号 財団法人国際超電導産業技術研究センター 超電導工学研究所内 Tokyo (JP). 和泉 輝郎 (IZUMI, Teruo) [JP/JP]; 〒135-0062 東京都江東区東雲1丁目10番13号 財団法人国際超電導産業技術研究センター 超電導工学研究所内 Tokyo (JP). 塩原 融 (SHIOHARA, Yuh) [JP/JP]; 〒135-0062 東京都江東区東雲1丁目10番13号 財団法人国際超電導産

[続葉有]

(54) Title: METHOD FOR FORMING THIN FILM ON BASIC MATERIAL THROUGH INTERMEDIATE LAYER

(54) 発明の名称: 基材上に中間層を介して薄膜を形成する方法



a...DISPLACEMENT FROM ATOMIC POSITION OF PERFECT CRYSTAL (%)
b...Sm123/MgO(Ba ON Mg)
c...BETWEEN ATOMS STRADDLING INTERFACE
d...Sm123/BZO(Ba IN BZO)

(57) Abstract: A technology for forming a thin film of good quality on a basic material through an intermediate layer. The technology is applied preferably to the formation of a high-temperature superconducting oxide thin film being employed in a superconducting wire material or a superconducting device. The method for forming a thin film on a basic material through an intermediate layer is characterized by comprising a process for calculating the energy E_a on the interface A between the basic material and the intermediate layer, the energy E_b on the interface B between the intermediate layer and the thin film, and the energy E_c on the interface C between the basic material and the thin film under a state where the intermediate layer does not exist, and a process for selecting an intermediate layer material satisfying the conditions $E_a < E_c$ and $E_b < E_c$.

[続葉有]

WO 2004/040046 A1